DACA42-03-C-0024

LOGANEnergy Corp.

Ft Gordon PEM Demonstration Program
Midterm Report

Proton Exchange Membrane (PEM) Fuel Cell Demonstration
Of Domestically Produced PEM Fuel Cells in Military Facilities

US Army Corps of Engineers
Engineer Research and Development Center
Construction Engineering Research Laboratory
Broad Agency Announcement CERL-BAA-FY02

Ft Gordon Army Base
Augusta, Georgia

September 2, 2004

Executive Summary

In preparation for its FY'02 CERL PEM Demonstration Program submittal, LOGAN approached Mr. Curtis Oglesby, Ft Gordon Energy Manager with the idea of submitting Fort Gordon to host a PEM demonstration project in CERL BAA FY'02 Program. Fort Gordon did not make the first cut, but in August 2003, CERL notified LOGAN that additional funds would be available to move forward with the Fort Gordon project.

In December 2003, Fort Gordon hosted a project kick-off meeting that was attended by representatives of CERL, LOGAN and representatives of the Directorate of Public Works. At the meeting, Mr. Glen Stubblefield, Fort Gordon project engineer, announced that the site selection team had changed the project site from the Garrison Commander's residence to the Army University of Technology Information Resource Center, Building #40201. Mr. Stubblefield explained that the Commander had decided coincidentally with the kick-off meeting that his residence should not act as the host site. Following the meeting, Mr. Stubblefield led the group on a tour of the Information Resource Center for the first time, where the project was very favorably received by the information technology staff. They were very pleased to host the project since the facility had no backup generator at the time. Since the site offered no opportunity for thermal recovery, the application was not included in the installation. However it is LOGAN's first opportunity to develop a PEM project in which the fuel cell is operating in a true mission critical role.

On January 14, 2004 Plug delivered GenSys SN#246 fuel cell to Fort Gordon. By mid February the project was well under way and its completion occurred on June 9 following the success of the 8-hour acceptance test.

The Ft Gordon POC is Mr. Glen Stubblefield. He may be reached by phone at 706 791-6184 or by email at stubbleg@gordon.army.mil.

GA Power supplies electric power and SCEG supplies natural gas to the base.

LOGAN estimates that during the demonstration period, Ft Gordon will incur $514 additional energy cost as a result of participating in this demonstration project.

Table of Contents

Proposal – Proton Exchange Membrane (PEM) Fuel Cell Demonstration of Domestically Produced Residential PEM Fuel Cells in Military Facilities

1.0 Descriptive Title

US Army University of Information Technology Center PEM Demonstration Program, Ft Gordon, Georgia

2.0 Name, Address and Related Company Information

LOGANEnergy Corporation

1080 Holcomb Bridge Road
BLDG 100- 175
Roswell, GA 30076
(770) 650- 6388

DUNS 01-562-6211
CAGE Code 09QC3
TIN 58-2292769

LOGANEnergy Corporation is a private Fuel Cell Energy Services company founded in 1994. LOGAN specializes in planning, developing, and maintaining fuel cell projects. In addition, the company works closely with manufacturers to implement their product commercialization strategies. Over the past decade, LOGAN has analyzed hundreds of fuel cell applications. The company has acquired technical skills and expertise by designing, installing and operating over 30 commercial and small-scale fuel cell projects totaling over 7 megawatts of capacity. These services have been provided to the Department of Defense, fuel cell manufacturers, utilities, and other commercial customers. Presently, LOGAN supports 30 PAFC and PEM fuel cell projects at 21 locations in 12 states, and has agreements to install 22 new projects in the US and the UK over the next 18 months.

3.0 Production Capability of the Manufacturer

Plug Power manufactures a line of PEM fuel cell products at its production facility in Latham, NY. The facility produces three lines of PEM products including the 5kW GenSys5C natural gas unit, the GenSys5P LP Gas unit, and the GenCor 5kW standby power system. The current facility has the capability of manufacturing 10,000 units annually. Plug will support this project by providing remote monitoring, telephonic field support, overnight parts supply, and customer support. These services are intended to enhance the reliability and performance of the unit and achieve the highest possible customer satisfaction. Scott Wilshire is the Plug Power point of contact for this project. His phone number is 518.782.7700 ex1338, and his email address is scott_wilshire@plugpower.com.

4.0 Principal Investigator(s)

Name	Samuel Logan, Jr.	Keith Spitznagel
Title	President	Vice President Market Engagement
Company	Logan Energy Corp.	Logan Energy Corp.
Phone	770.650.6388 x 101	860.210.8050
Fax	770.650.7317	770.650.7317
Email	samlogan@loganenergy.com	kspitznagel@loganenergy.com

5.0 Authorized Negotiator(s)

Name	Samuel Logan, Jr.	Keith Spitznagel
Title	President	Vice President Market Engagement
Company	Logan Energy Corp.	Logan Energy Corp.
Phone	770.650.6388 x 101	860.210.8050
Fax	770.650.7317	770.650.7317
Email	samlogan@loganenergy.com	kspitznagel@loganenergy.com

6.0 Past Relevant Performance Information

a) Contract: PC25 Fuel Cell Service and Maintenance Contract #X1237022

Merck & Company
Ms. Stephanie Chapman
Merck & Company
Bldg 53 Northside
Linden Ave. Gate
Linden, NJ 07036
(732) 594-1686

Contract: Four-year PC25 PM Services Maintenance Agreement.
In November 2002 Merck & Company issued a four-year contract to LOGAN to provide fuel cell service, maintenance and operational support for one PC25C fuel cell installed at their Rahway, NJ plant.

b) Contract: Plug Power Service and Maintenance Agreement to support one 5kWe GenSys 5C and one 5kWe GenSys 5P PEM power plant at NAS Patuxant River, MD.

Plug Power
Mr. Scott Wilshire.
968 Albany Shaker Rd.
Latham, NY 12110
(518) 782-7700 ex 1338

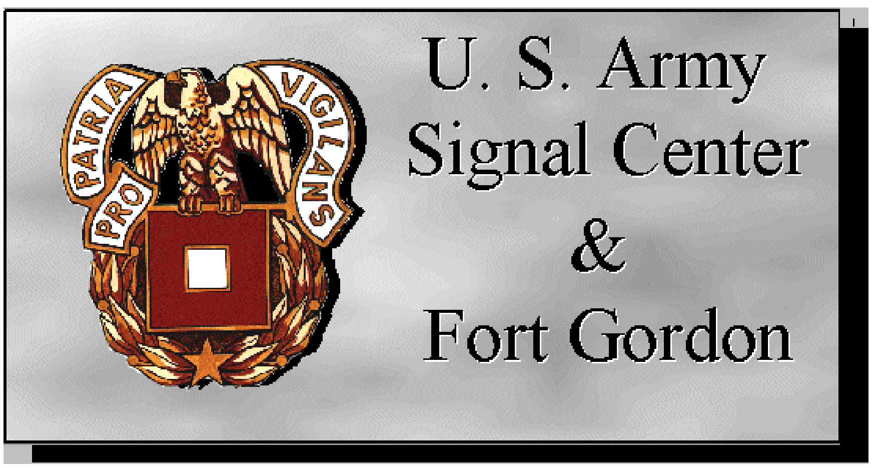
LOGAN performed the start-up of both units after Southern Maryland Electric Cooperative completed most of the installation work. The units are located at residential sites at Patuxant River Naval Air Station, VA and operate in standard gird connected/grid independent configurations.

c) Contract: A Partners LLC Commercial Fuel Cell Project Design, Installation and 5-year service and maintenance agreement.
Contract # A Partners LLC, 12/31/01

Mr. Ron Allison
A Partners LLC
1171 Fulton Mall
Fresno, CA 93721
(559) 233-3262

On April 20, 2004 LOGAN completed the installation of a 600kWe PC25C CHP fuel cell installation in Fresno, CA. The system operating configurations allow for both grid parallel and grid independent energy service. The grid independent system is integrated with a multi unit load sharing electronics package and static switch, which initial development was funded by ERDC CERL in 1999.

6.0 Host Facility Information



The U.S. Army Signal Center and Fort Gordon have a mission that includes communications training, doctrine, force integration and mobilization. The Signal Center conducts specialized instruction for all Signal Regiment military and Department of the Army civilian personnel, and provides doctrine and training development support of publications. Three Training and Doctrine Command systems managers coordinate acquisition and fielding of major systems.

Force integration is accomplished through the lifecycle management of all major communications-electronics systems under study, in development or in use in the field Army.

The mobilization mission is to maintain assigned Forces Command units in a state of readiness commensurate with their authorized level of organization. The Reserve Components Support Division provides year-round training for more than 60,000 reservists, as well as Army and Navy Reserve Officer Training Corps students.

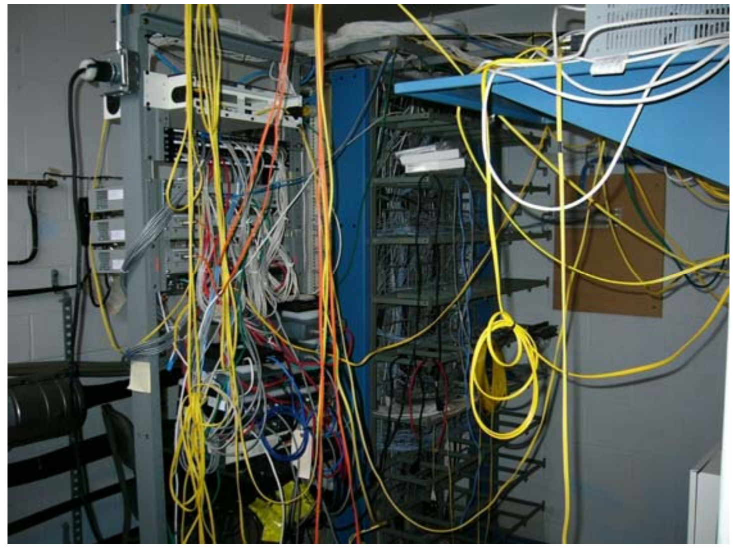
Pictured at left is a photo of the Army University of Information Technology Center, which houses a virtual online learning center for stateside and deployed US armed forces personnel. This facility was selected as an alternate to host the demonstration unit because of the need to provide back up to the servers that support the online virtual training center. The product chosen for this project is the Plug Power 5kW GenSys5C natural gas fuel cell. The system will operate nominally in a grid parallel/synchronized configuration with a 2.5 kW output. When operating at 2.5 kW the unit consumes 3,500 SCFH natural gas based on a LHV of 933Btu/SCF.

8.0 Fuel Cell Installation

Figure 1

Figure 2

Figures 1 and 2, above are photos of the fuel cell on its pad at the rear entrance to the Army University of Information Technology Center. The virtual University provides 24/7 online training in electronics and communications equipment operations and repair for all branches of the US Armed Forces. Students subscribe for online courses and log into the university network to gain access to the training materials. These courses are important to military communications specialists to increase their knowledge and skills not only to support and operate new systems but also to acquire course credits necessary for advancement in grade.



The photo at right shows one section of the bank of computer servers that provide the direct training links to the university's world wide student body. Before the arrival of the fuel cell, the University had only 15 minutes of back-up power provided by a battery UPS. This antiquated system permitted IT personnel just enough time to exercise a controlled shut down of the university servers whenever power failed. With the fuel cell operating, now they will be able to keep the University on line all the time.

Prior to starting the project, LOGAN procured a digging permit from the Directorate of Civil Engineering prior to starting work. No other permits were required at this site.

Ft Gordon Army University of Information Technology Center, PEM Installation Line Diagram

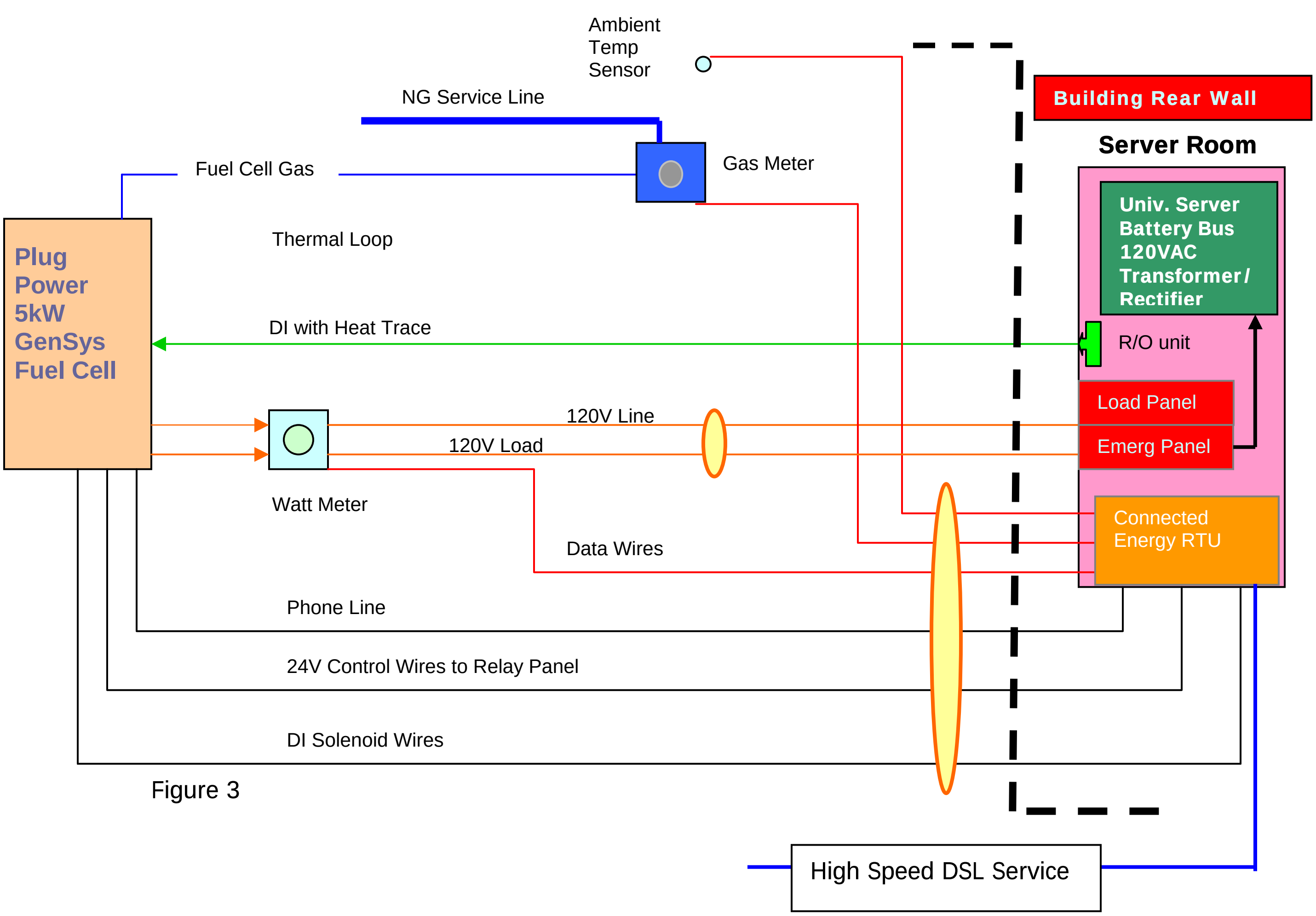


Figure 3

Figure 3, above, describes a one line diagram of the Ft Gordon fuel cell installation. The diagram illustrates utility, emergency power supply, and control interfaces including, gas, power, water and instrumentation devices installed at the University building.
The electrical conduit runs between the facility load panels and the fuel cell are approximately 15 feet. The Reverse Osmosis/DI water tubing run that provides filtered process water to the power plant is approximately 15 feet distance between the filtration unit and the fuel cell.

9.0 Electrical System

The GenSys fuel cell inverter has a power output of 110/120 VAC at 60 Hz, matching the building distribution panel in the server room. The installation includes both a grid parallel and a grid independent operating configuration as illustrated in Figure 3 above. While functioning in a normal grid parallel/synchronous configuration, the unit provides a steady output of 2.5kW to a new 60 amp circuit breaker in the existing panel seen in the photo at right. A two-pole wattmeter monitors both the grid parallel and grid independent conductors to record fuel cell power distribution to both the existing panel and the new critical load panel.

Figure 4

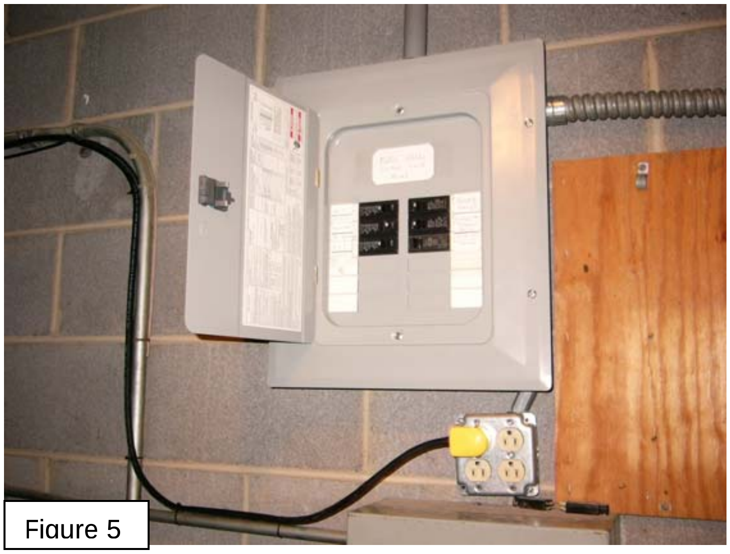


Figure 5

Pictured at left is the new critical load panel that LOGAN installed to provide backup power for the server UPS system. The fuel cell inverter controller monitors the gird while operating in a normal grid parallel/synchronous configuration providing base load power. When the controller detects a loss of grid signal, it electrically disconnects from the utility grid at the 60 amp circuit breaker described above, and reconfigures to the grid independent operating mode in order to follow only the discrete load requirements on the critical load panel. While the grid is unavailable, the fuel cell will provide up to 45 amps of power to the critical panel. Once the grid returns to duty, the fuel cell inverter will revert to the base load configuration again. Since the change back and for the between the two operating configurations requires 2 seconds, the existing UPS batteries carry the server loads during the short interval.

Note the conduit carrying the grid independent conductor from the fuel cell entering the critical load panel in the top right of the photo above. Note, also, the Server UPS power cord with the yellow connector head in the photo. Whereas this cord was once plugged into a common wall outlet, it now has two independent sources of power, both grid and fuel cell, substantially enhancing power availability to the university's servers and their ability to accomplish their mission.

11.0 Data Acquisition System

The Ft. Gordon site is the fourth in a series of PEM sites where LOGAN has employed a Connected Energy Web communications package. In contrast to earlier projects, this installation has not encountered any installation problems.
Over the last two years in the course of developing numerous small-scale PEM fuel cell sites, LOGAN is learning to appreciate the importance of Web based real-time communications to manage distributed resources. With growing numbers of fuel cell units operating at diverse locations across the US, this capability introduces a cost effective means of supporting the fleet and capturing data that is necessary to manage systems and evaluate performance. While individual system installations are still very costly, they do provide a more cost effective means of managing distributed generation resources. As an example, the primary field engineer for this project has to travel approximately 4 hours to reach the fuel cell site. Typically these trips are necessary to service and maintain the fuel cell installation or to download performance data. With the advent of real-time communications, streaming data is continuously stored at a central hub, and it is constantly available for retrieval and analysis. The communications package also provides the operator with functional screens that display system status and performance, operational trending, system alarming and service callouts. Having access to this information refines the troubleshooting process when malfunctions occur, and permits the distributed generation operator to support more units over a wider area with fewer service personnel than would otherwise be possible. In many cases today, complete troubleshooting of a system alarm, turndown or shutdown may be performed from a computer terminal. With the next generation system, it will be possible to make remote corrective inputs to the system to reduce shutdown incidents or at least dispatch service confidently with the parts necessary to quickly turn the unit around.

At this point on the system learning curve, LOGAN has recognized that system dependability is more difficult to achieve than a simple “plug and play” device. For example, the quality and reliability of individual sensors and instrumentation that create and send output signals to terminals at the web router interface are critical to optimum performance. Invariably, these components require signal strength adjustment at the RTU terminals to insure that their discrete inputs are readable by the CEC system. Discovering the proper voltage range required for each signal loop is most often achieved by trial and error, requiring multiple site visits to establish a readable connection. In other instances LOGAN has discovered that flow metering devises and thermal couples often require high levels of maintenance and/or replacement to support continuous data collection. Heretofore LOGAN has purchased comparatively inexpensive components to meet these requirements, but has learned the value of installing robust and durable commercial grade components that cost more to install but provide trouble free service.

Pictured below, Figure 6, is schematic drawing of the RTU Web communications package architecture installed at this site, and below that, Figure 7, an example of one of many online data screens maintained by the Connected Energy control center. This particular screen provides the operator with a quick indication of system status. To view the operation of this unit, log on to https://www.enerview.com/EnerView/login.asp
Then login as: Logan. User and enter password: guest. Select the box labeled Ft. Gordon, or navigate other LOGAN sites using the tool bars or html keys.

Section 1 in the Appendix contains a chart detailing the performance of the Yosemite fuel cell since its initial start.

Connected Energy System RTU Architecture

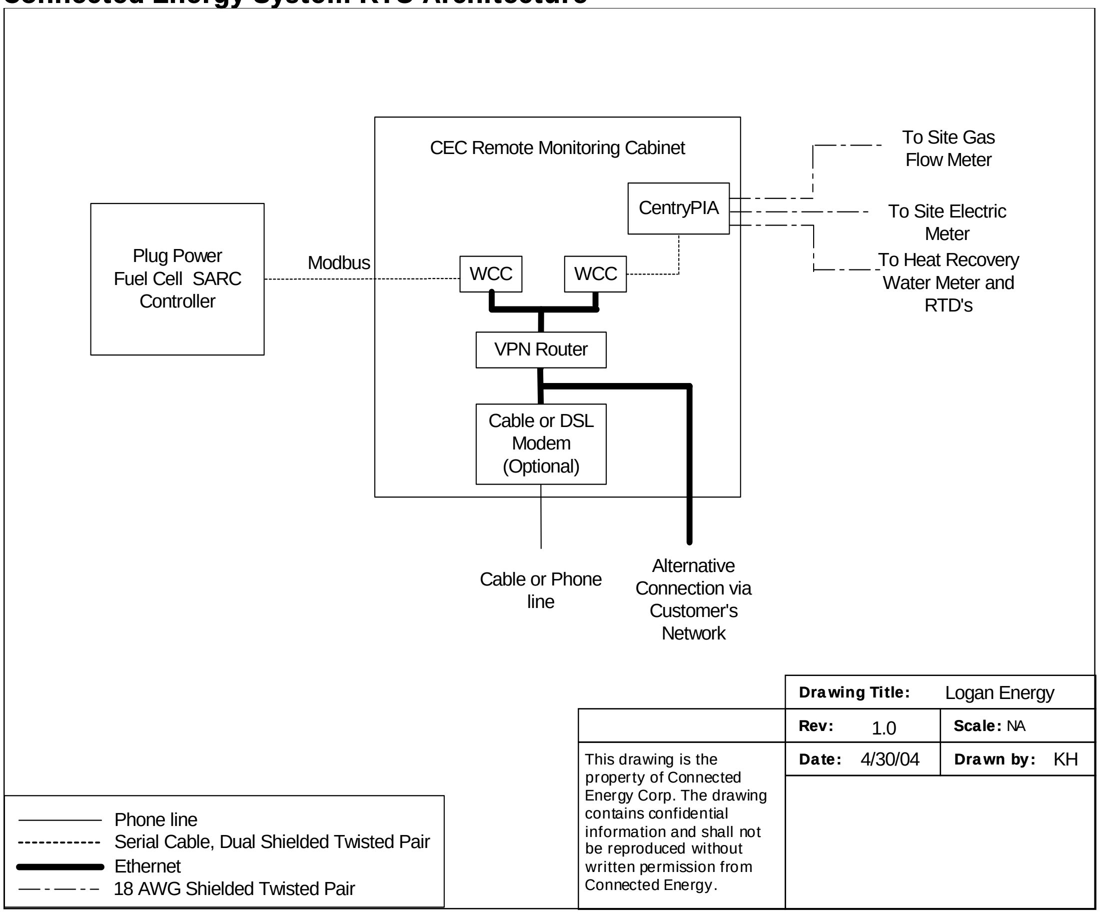


Figure 6

Ft. Gordon PEM Operating Status Screen.

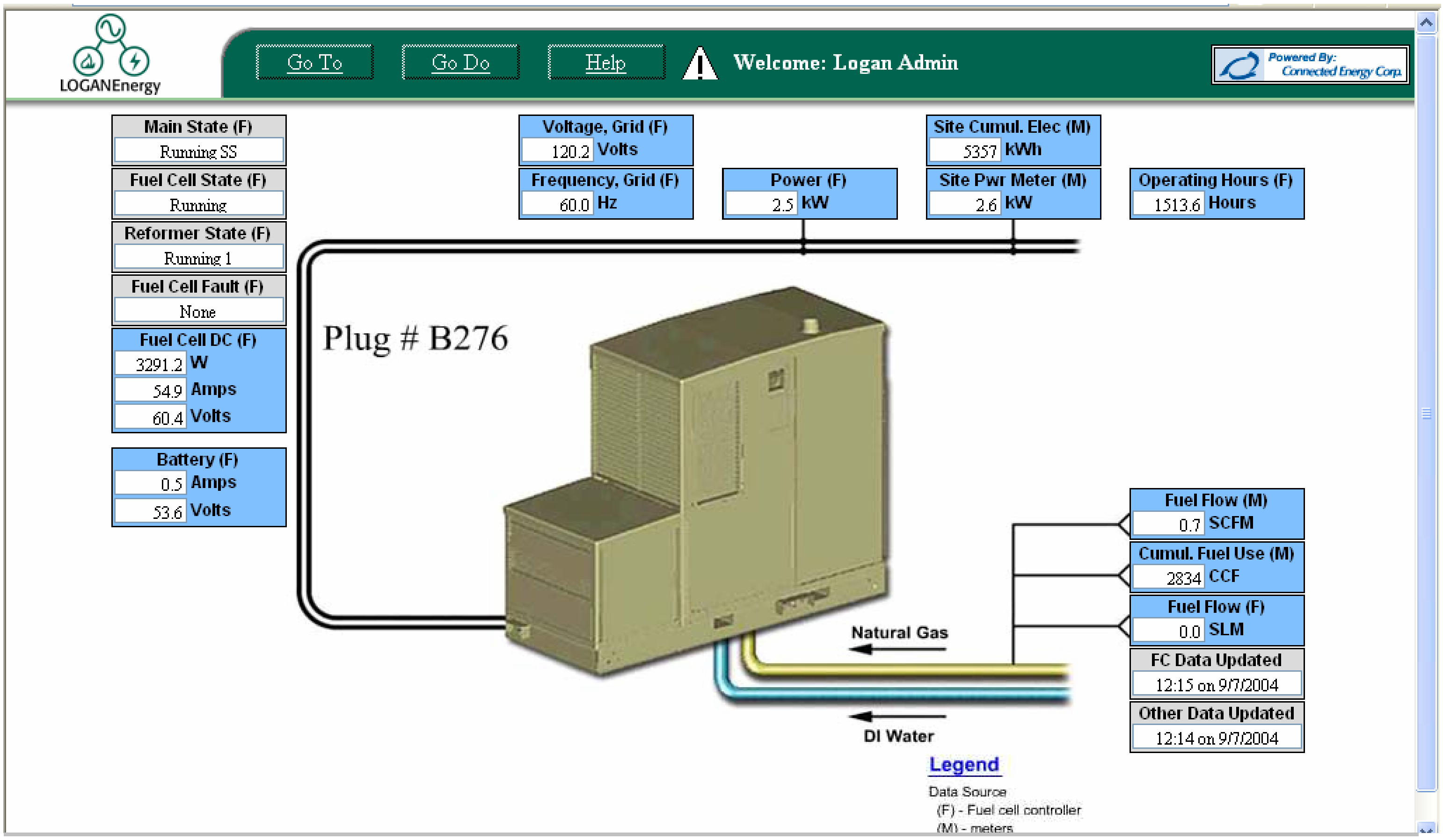


Figure 7

With a quick glance this screen provides the operator with the operating status of Plug unit #B276 including, Cell Stack DC volts and amps, fuel cell kW output, fuel flow and the most recent update to the screen.

12.0 <u>Fuel Supply System</u>

LOGAN connected the fuel cell gas piping with the existing gas service conveniently located adjacent to the fuel cell pad at the rear of the university building, seen in Figure 8 below. A regulator at the fuel cell gas inlet maintains the correct operating pressure at 10-14 inches water column. While operating nominally at 2.5kW, the GenSys5C consumes 3,500SCFH of natural gas based on a LHV of 933Btu/SCF.

Figure 8

13.0 Installation Costs

Ft Gordon PEM Demonstration Program

Project Utility Rates				
1) Water (per 1,000 gallons)		$ 0.95		
2) Utility (per KWH)		$ 0.058		
3) Natural Gas (per MCF)		$ 6.35		
First Cost			**Estimated**	**Actual**
Plug Power 5 kW SU-1			$ 65,000.00	$ 65,000.00
Shipping			$ 1,800.00	$ 1,800.00
Training			$ 500.00	
Engineering			$ -	$ 698.00
Installation electrical			$ 4,500.00	$ 4,400.00
Installation mechanical			$ 5,900.00	$ 3,280.00
Watt Meter, Gas Meter			$ 1,235.00	$ 1,235.00
CE RTU			$ 8,500.00	$ 9,500.00
Site Prep, labor materials			$ 1,025.00	$ 1,508.00
Technical Supervision/Start-up			$ 4,800.00	$ 4,800.00
Total			**$ 93,260.00**	**$ 92,221.00**
Assume Five Year Simple Payback			$ 18,652.00	$ 18,444.20
Forcast Operating Expenses	Volume	$/Hr	$/ Yr	
Natural Gas Mcf/ hr @ 2.5kW	0.035	$ 0.22	$ 1,752.22	
Water Gallons per Year	14,016		$ 13.32	
Total Annual Operating Cost				$ 1,765.53
Economic Summary				
Forcast Annual kWH		19710		
Annual Cost of Operating Power Plant		$ 0.090	kWH	
Est Credit Annual Thermal Recovery		$ -	kWH	
Project Net Operating Cost		$ 0.090	kWH	
Displaced Utility cost		$ 0.058	kWH	
Energy Cost (Increase), Decrease		($0.032)	kWH	
Annual Energy (Increase), Decrease		($622.35)		

Explanation of Calculations:

Actual First Cost Total is a *sum* of all the listed first cost components.
Assumed Five Year Simple Payback is the Estimated First Cost Total *divided by* 5 years.
Forecast Operating Expenses:

At 2.5 kW the fuel cell consumes 0.035 Mcf per hour. The cost per hour is 0.035 Mcf per hour *x* the cost of natural gas $6.35/MCF. The cost per year, $1643 is the cost per hour at $0.21 *x* 8760 hours per year *x* 0.9. The 0.9 is for 90% availability.

Natural gas fuel cell systems set at 2.5 kW will consume 1.6 gallons of water per hour through the DI panel. The total volume of water consumed at 14,016 gallons per year is 1.6 gph *x* 8760 hours per year *x* 90% availability. Based on this schedule water consumption for the project will cost $13.32.

The Total Annual Operating Cost, $1657.30 is the *sum of* the cost per year for the natural gas and the cost per year for the water consumption.

Economic Summary:

The Forecast Annual kWh at 19,710 kWh is the product of 2.5 kW set point for the fuel cell system *x* 8760 hours per year *x* 0.9. The 0.9 is for 90% availability.

The calculated Cost of Operating the Power Plant equals $0.084 per kWH; that is the Total Operating Cost of $1657.30 *divided* by the forecast annual kWh at 19,710 kWh.
The Displaced Utility Cost is the kWh cost of electricity paid by the base.

Energy (Increase)/Decrease equals the cost difference between the Displaced Utility Cost and the Project Net Operating Cost.

Annual Energy (Increase)/Decrease equals the cost kW differential, calculated above, times the Forecast Annual kWh.

14.0 Acceptance Test

The 8-hour acceptance test concluded on June 9, 2004, following the first successful start-up of the system. The time allotted for each task in the report approximate the standards recommended by the manufacturer. Please see Appendix 2 for Installation and Start-up Test Report.

Appendix

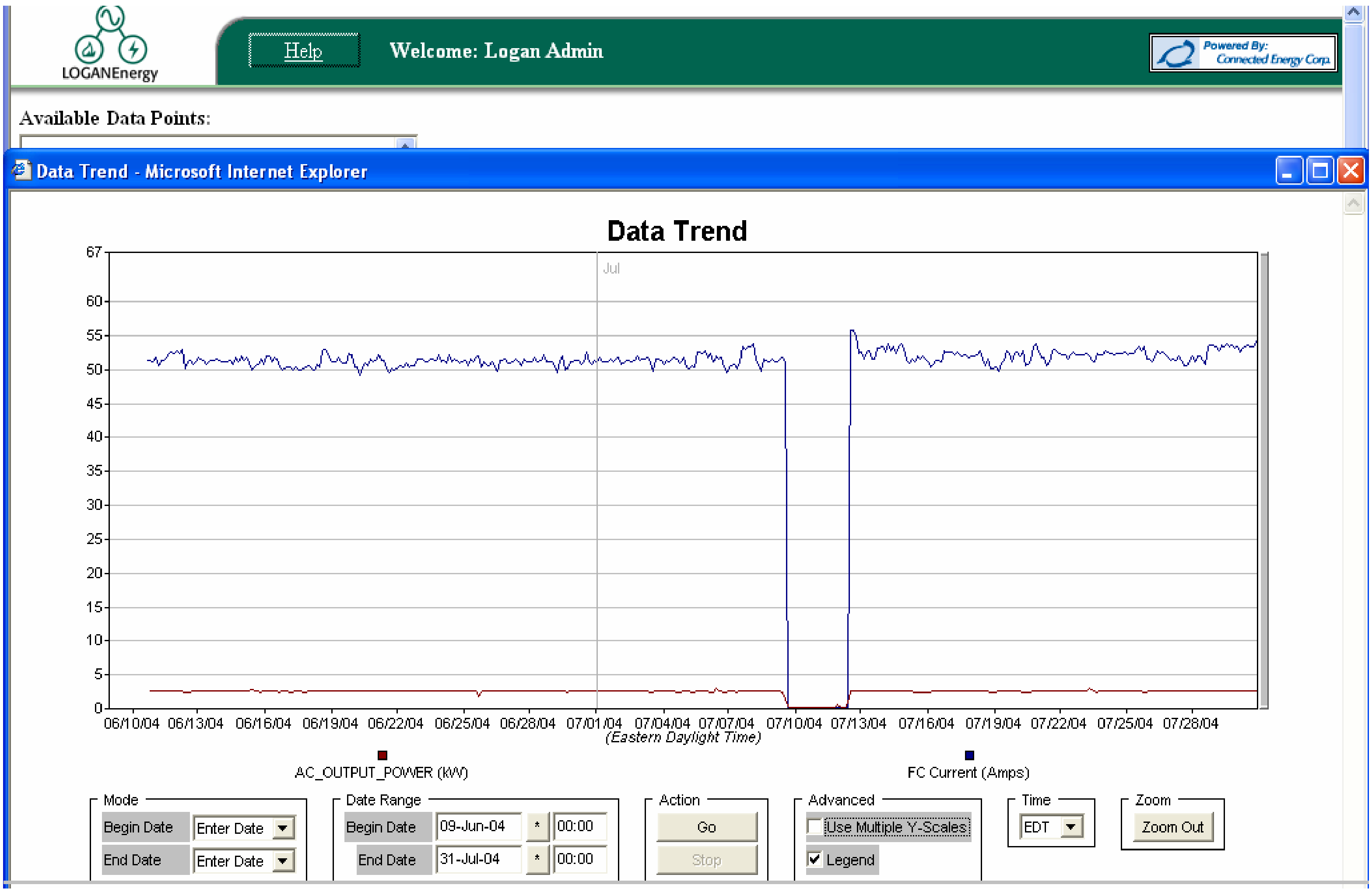
1) Monthly Performance Data

2) Installation and Start-up Test

3) Daily Work Logs

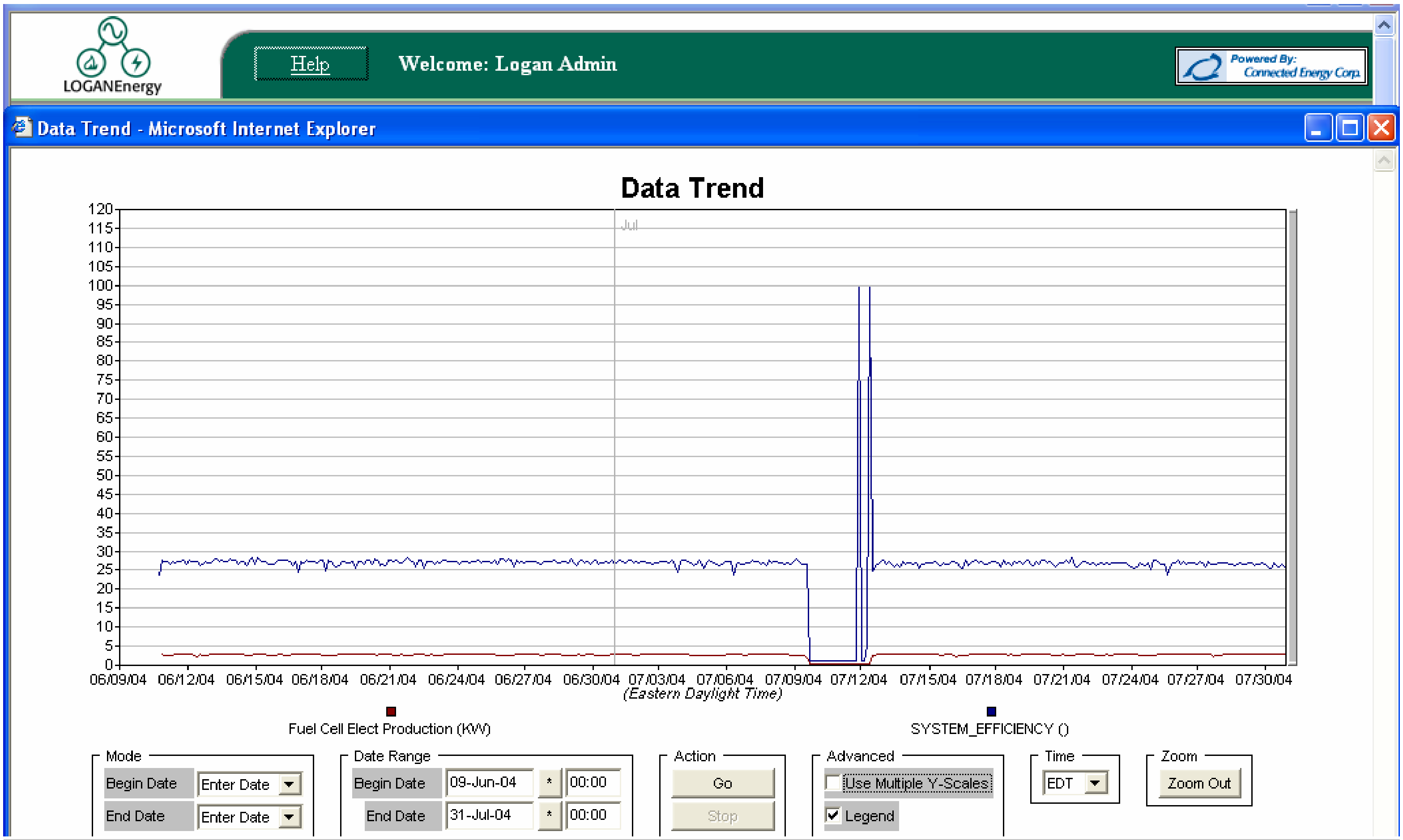
Appendix

1) Monthly Performance Data
This chart plots cell stack current, measured in DC amps, against actual inverter output of 2.5kW from June 9, 2004, the initial start date, through July 31, 2004. The two days of missing data coincide with the forced outage caused by a clogged filter.



Additional Performance Trending

The chart below plots system electrical efficiency against a power generation set point of 2.5 kWh. This chart indicates that at a constant set point of 2.5kWh, system electrical efficiency tracked at approximately 25% during the period June 9, 2004 through July 31, 2004.



Logan Energy/Ft. Gordon Fuel Cell Monthly Performance

Report start date: 6/9/2004

Report end date: 7/31/2004

Time Frame	Total kWh Produced	Average kW Rate	Electrical Efficiency, LHV
6/1/2004	1,222.70	2.53	24.67
7/1/2004	1,701.00	2.32	21.88
8/1/2004	1,864.60	2.52	23.43
Average:	5,274.30	2.48	23.33

2) Installation and Acceptance Test

Site: Ft Gordon, Augusta, GA

Installation Check List

TASK	Initials	DATE	TIME (hrs)
Batteries Installed	MH	5/18/04	2
Stack Installed	MH	5/18/04	3
Stack Coolant Installed	MH	5/18/04	1
Air Purged from Stack Coolant	MH	5/18/04	1
Radiator Coolant Installed	MH	5/18/04	1
Air Purged from Radiator Coolant	MH	5/18/04	1
J3 Cable Installed	MH	6/08/04	1
J3 Cable Wiring Tested	MH	6/08/04	0.5
Inverter Power Cable Installed	MH	6/08/04	0.5
Inverter Power Polarity Correct	MH	6/08/04	0.5
RS 232 /Modem Cable Installed	MH	6/08/04	0.5
Natural Gas Pipe Installed	MH	5/17/04	4
DI Water / Heat Trace Installed	MH	5/05/04	3
Drain Tubing Installed	MH	5/05/04	1

Commissioning Check List and Acceptance Test

TASK	Initials	DATE	TIME (hrs)
Controls Powered Up and Communication OK	MH	6/08/04	4
SARC Name Correct	MH	6/08/04	1
Start-Up Initiated	MH	6/08/04	2
Coolant Leak Checked	MH	6/08/04	1
Flammable Gas Leak Checked	MH	6/08/04	1
Data Logging to Central Computer	MH	6/08/04	1
System Run for 8 Hours with No Failures	MH	6/09/04	8

3) Daily Work Logs

Installation and Incident Work Logs
LOGANEnergy Field Technician

LOGANEnergy Corp.
Monthly Site Report
Period February-04
Site Fort Gordon

Engineer	Date	PP S/N	Activity
Harvell	2/5/04	276	Met with Stubblefield, then went to site to take measurements and find water and gas supply and where components would be located. At site, met with base electrician who will help locate correct circuits later on. We will focus on permits at this point.
Harvell	2/25/04	276	Met with Forest Garner to get the underground utility marking process underway.

LOGANEnergy Corp.
Monthly Site Report
Period March-04
Site Fort Gordon

Engineer	Date	PP S/N	Activity
Harvell	3/11/04	276	Dropped off supplies gleaned from Ft. Jackson.
Harvell	3/24/04	276	Drove to Augusta. Found supplies needed to make a foundation for fuel cell. Installed foundation. Drove home.
Harvell	3/25/04	276	Drove to Augusta. Worked with base personnel to get FC transported and placed on pad. Drove home.

LOGANEnergy Corp.
Monthly Site Report
Period April-04
Site Fort Gordon

Engineer	Date	PP S/N	Activity
Harvell	4/19/2004	276	Drove to Augusta. Began plumbing and electrical work.
	4/20/2004	276	Continued work on plumbing and electrical hookups. Drove home.
	4/21/2004	276	Continued plumbing and electrical. Drove home.
Worley	4/19/2004		Travel to Augusta and site to determine material requirements for installation
Worley	4/20/04	276	Ran conduit, gas line, set meter base, etc.
Worley	4/21/04	276	Continued work at site and return home

LOGANEnergy Corp.

Monthly Site Report

Period May-04

Site Fort Gordon

Engineer	Date	PP S/N	Activity
		276	
Harvell	5/4/04	276	Planning and Scheduling of Tasks
	5/5/04	276	Terminating some of the control wires. Locating an electrician. Meeting with communications personnel to discuss voice and ethernet. Running water line to DI panel.
	5/6/04	276	Met with Hammett Electric who will be doing the electrical terminations. Met with Marc Laurent who will be helping find the circuits for the CL. Wired disconnect box. Ran voice and CAT5 cable to their server room. Administration.
Worley	5/17/04		Drove to Augusta to continue work on installation. Identified circuits to be moved to critical load panel.
	5/17/04	276	Tied in gas line and found which circuits we would put on the CL panel.
Worley	5/18/04		Returned to site to meet electicians. Electricians did not show. Filled fuel cell with therminol.
Worley	5/19/04		Returned to site with electricians. Wired in critial load panel. Added additional 30A circuit to critical load. Labeled and documented all wiring. Main panel circuits 10, 12, and 33 moved to critical load panel.

LOGANEnergy Corp.

Monthly Site Report

Period June-04

Site Fort Gordon

Engineer	Date	PP S/N	Activity
M Harvell	6/8/04	276	Ft. Gordon is up and running. The modem was bad on the SARC, so I replaced it and upgraded its software. The modem test passed the two times I tried it. The anti-islanding test went off without a hitch (twice). The Connected Energy system is up and running At this juncture, and assuming it doesn't shut down in the next few days, we will use June 9, 2004 as the commissioning date.
Harvell	6/8/04	276	Could not get modem to function properly. Shut system down, installed a new SARC, loaded v.1.29 software and restarted. Completed startup procedures and left unit running at 2.5kW.
		*******	**Commission Start Date is 6/9/04**
Worley	6/28/04	276	Monday - Drive to Fort Gordon and install additional particulate filter and iron filter on DI water supply. Also, placed posts in ground to protect fuel cell from vehicle traffic. Painted posts safety yellow.

Monthly Site Report
Period July-04
Site Fort Gordon

Engineer	Date	PP S/N	Activity
		276	COMSYS detected the following alarm: ALARM: Fuel Cell B276 Shutdown ALARM TIME: 7/9/2004 2:47:50 PM UTC EQUIPMENT: SITE: Ft. Gordon
		276	System Status: Running – requires maintenance Incident Description: 7/9/2004 2:46:50 PM, Running (51) SHUTDOWN, LEVS5_HUMID_LOW_SD, Error Code: (377) Incident Resolution: Mike Harvell restarted the unit but did not have new filters with him. He was able to tweak the DI panel to produce enough water but the filters will need replacement very soon 1-2 days.
Worley	7/12/2004	276	Monday - drove to Fort Gordon.
Worley	7/13/2004	276	Tuesday - Went to site to replace RO filter and charcoal filter. Set DI panel trim flow. System operating normally.